Thermal Characterization of Pine, Swietenia Macrophyla and Cedrela Odorata Woods by Photoacoustic and Photothermal Techniques

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Photoacoustic and photothermal techniques are used to investigate the thermophysical properties at room temperature for each of the three main planes of nine species of pine as well as swietenia macrophyla and cedrela odorata woods. The open-photoacoustic-cell approach is used to measure thermal diffusivity while the photothermal technique of continuous illumination of the sample in vacuum is used to measure the product of density and specific heat capacity.

Thermal conductivity and effusivity are derived from these measurements. We report on correlations among the measured parameters and other physical variables for the samples studied and conclude that these techniques are well suited to study thermal properties of woods.